October 3, 2002

Acquisition

Acquisition of the Advanced Deployable System

(D-2003-004)

Department of Defense
Office of the Inspector General

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Acronyms

ADS	Advanced Deployable System
C^4I	Command, Control, Communications, Computers, and Intelligence
CARD	Cost Analysis Requirements Description
DCMA	Defense Contract Management Agency
EAC	Estimate at Completion
EVMS	Earned Value Management System
ORD	Operational Requirements Document

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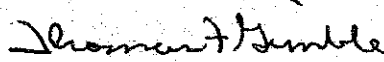ARLINGTON, VIRGINIA 22202-4704

October 3, 2002

MEMORANDUM FOR NAVAL INSPECTOR GENERAL

SUBJECT: Report on Acquisition of the Advanced Deployable System
(Report No. D-2003-004)

We are providing this report for information and use. We considered
management comments on a draft of this report when preparing the final report.

Comments on the draft report conformed to the requirements of DoD
Directive 7650.3 and left no unresolved issues. Therefore, no additional comments are
required.

We appreciate the courtesies extended to the staff. Questions should be directed
to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) (jmeling@dodig.osd.mil) or
Ms. Susan J. Lippolis at (703) 604-9081 (DSN 664-9081) (sjlippolis@dodig.osd.mil).
See Appendix D for the report distribution. The team members are listed inside the back
cover.

David K. Steensma
Deputy Assistant Inspector General
for Auditing

Acquisition of the Advanced Deployable System

Executive Summary

Who Should Read This Report and Why? This report should be read by all who are interested in the acquisition of the Navy's Advanced Deployable System (the System). The report addresses acquisition issues that require higher management attention before the System program should be allowed to progress further through the acquisition process.

Background. The System, a Navy Acquisition Category II program, is a next-generation, ship-deployable, undersea surveillance system that is designed to operate in littoral waters. The System is linked to a land facility for data processing, evaluation, and reporting. The System will be used to conduct missions, such as threat port surveillance, friendly port protection, area defense, area sanitization, and strategic indications and warnings. The System will have the ability to be installed overtly or covertly, depending on the needs of the Joint Task Force Commander. The program office's estimate includes $793.7 million for research, development, test, and evaluation for all four blocks of the evolutionary acquisition strategy and $785 million for procurement for the first two blocks.

Results. Overall, the System program warrants attention in the areas of acquisition category designation, earned value management, and documentation before it enters the full-rate production phase of the acquisition process.

- The System program manager did not inform the Assistant Secretary of the Navy (Research, Development, and Acquisition) that the oversight of the program should be raised to the level of an acquisition category I program. As a result, acquisition management oversight was not provided commensurate with that required for an acquisition category I program. Designating the System as an acquisition category I program should provide the oversight necessary for an acquisition program of this magnitude (finding A).

- The program office did not apply standard estimate-at-completion formulas in calculating earned value management computations and did not request the Defense Contract Management Agency to review earned value management calculations. As a result, the program office's estimate at completion was significantly lower than the estimate at completion calculated using standard formulas and did not provide decision makers with accurate data on estimated contract cost overruns. Revising the current draft memorandum of agreement between the program office and the Defense Contract Management Agency to include Defense Contract Management Agency oversight of contractor earned value management calculations will help provide accurate earned value management data to decision makers (finding B).

- The System program office had not completed actions to update the acquisition strategy; cost analysis requirements description; life-cycle cost estimate; command, control, communications, computers and intelligence support plan; and programmatic environmental, safety, and health evaluation plan as required to show the current status of the program. As a result, the program manager did not have up-to-date acquisition documentation needed to effectively manage program cost and performance and acquisition decision makers could not make fully informed investment decisions (finding C).

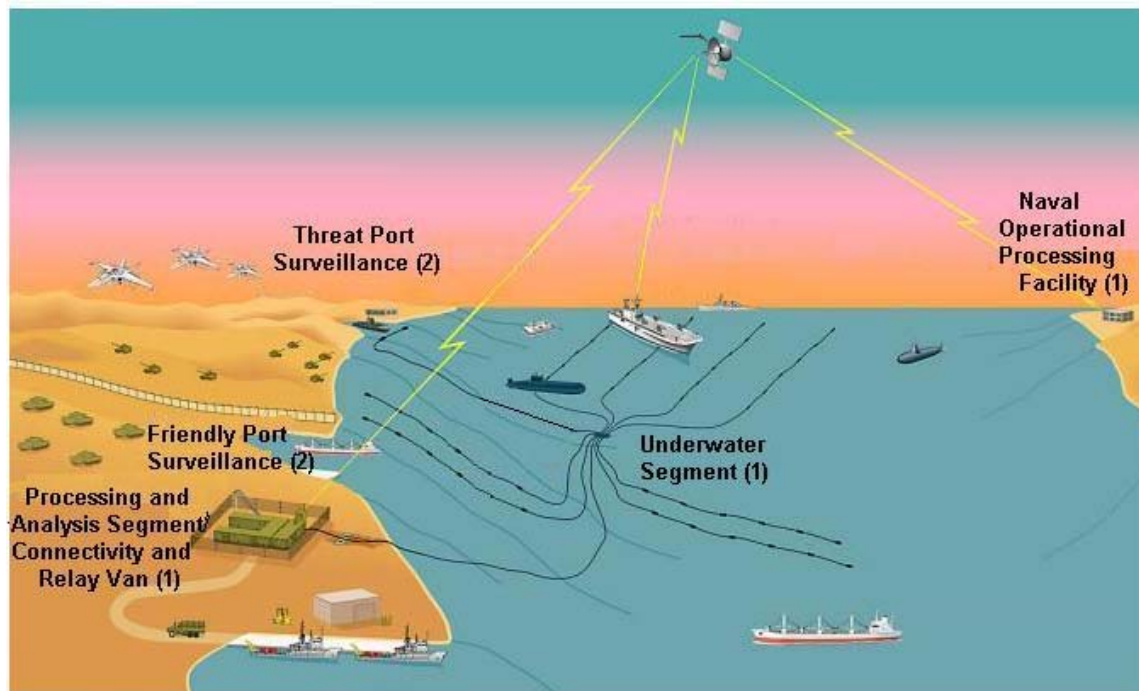For details of the audit results, see the Findings section of the report.

Management Comments. The Navy concurred with the audit findings and all recommendations; therefore, no further comments are required. The Findings section of the report contains a summary of the management comments and the Management Comments section contains the complete text of management comments.

Table of Contents

(1) Elements of Advanced Deployable System
(2) Description of environment

Source: Space and Naval Warfare Systems Command (U.S. Navy), Advanced Deployable System Program Office

Advanced Deployable System

Background

The Advanced Deployable System (ADS), a Navy Acquisition Category II program, is a next-generation, ship-deployable, undersea surveillance system that is designed to operate in littoral waters. The ADS is linked to a land facility for data processing, evaluation, and reporting. The system consists of three major segments:

- The underwater segment, which provides the acoustic sensing, cabling, and telemetry.

- The processing and analysis segment, which performs the signal processing; display functions; and command, control, communications, and intelligence (C^4I).

- The mission support segment, which provides system support and installation functions.

The ADS will provide the Joint Task Force Commander with the capability to rapidly and flexibly install, from a variety of possible platforms, an acoustic, littoral surveillance system that provides a complete undersea picture and target locations to tactical systems. The ADS will be used to conduct missions, such as threat port surveillance, friendly port protection, area defense, area sanitization, and strategic indications and warnings. The system will have the ability to be installed overtly or covertly, depending on the needs of the Joint Task Force Commander. The ADS program includes two platforms for deployment, Platform Alpha and Platform Bravo. Appendix B provides definitions of technical terms used in this report.

At the engineering and manufacturing decision meeting held on February 10, 2000, the Assistant Secretary of the Navy (Research, Development, and Acquisition), the milestone decision authority, approved the Platform Alpha portion of the ADS program to enter the engineering and manufacturing development phase of the acquisition process. The Platform Bravo portion was to remain in the program definition and risk reduction phase, pending accomplishment of an at-sea demonstration and a program review in 2001. The April 2001 review addressed a major program restructuring, revision of the acquisition decision memorandum, and a requirement for a followup review in the fourth quarter of FY 2002. The major program restructuring resulted in the program office using a four-block evolutionary acquisition strategy to develop the ADS. The program office's estimate includes $793.4 million for research, development, test, and evaluation for all four blocks of the evolutionary acquisition strategy and $785 million for procurement for the first two blocks.

Major Program Revisions

The ADS program has gone through a number of changes over its life. Originally, the ADS program office was to pursue Platform Alpha and Platform Bravo concurrently to provide the Navy with multiple deployment options. In February 2000, because the milestone decision authority approved only the

Platform Alpha for engineering and manufacturing development, the program structure concentrated on that platform. Subsequently, a program budget reduction made it apparent that engineering and manufacturing development for both platforms could not be pursued concurrently, regardless of the results of the Platform Bravo program review in 2001. In April 2001, the Office of the Chief of Naval Operations directed a restructure of the program to concentrate efforts on one version of deployment from Platform Bravo, followed by two additional versions of deployment from Platform Bravo and one version of deployment from Platform Alpha. As a result, the program office devised a four-block evolutionary acquisition strategy. The Assistant Secretary of the Navy (Research, Development, and Acquisition) approved the restructuring in May 2001, and required that a followup program review be held in approximately 1 year, allowing time for the modification and approval of the operational requirements document (ORD) and development of a new acquisition program baseline agreement. The followup program review is scheduled for the fourth quarter of FY 2002 because of delays in the ORD approval process.

Objectives

The audit objective was to evaluate the overall management of ADS. Because the program was in the engineering and manufacturing development phase, we determined whether management was cost-effectively developing and readying the system for the full-rate production phase of the acquisition process. In addition, we evaluated the management control program as it related to the audit objectives. See Appendix A for a discussion of the audit scope, methodology, the review of the management control program, and prior coverage related to the audit objectives.

A. Acquisition Category

The ADS program manager did not inform the Assistant Secretary of the Navy (Research, Development, and Acquisition) that the oversight of the program should be raised to the level of an acquisition category I program. This condition occurred because the program manager believed that cost information showing that the program had exceeded established thresholds for research, development, test, and evaluation had been provided to the Assistant Secretary of the Navy and that no further action on his part was required. As a result, acquisition management oversight was not provided commensurate with that required for an acquisition category I program.

Acquisition Category Guidance

DoD defines an acquisition category as an attribute of an acquisition program that determines the program's level of review, decision authority, and applicable procedures. Acquisition category I programs include two subcategories: acquisition category ID programs where the milestone decision authority is the Under Secretary of Defense for Acquisition, Technology, and Logistics, and acquisition category IC programs where the milestone decision authority is the Component Acquisition Executive.

DoD Instruction 5000.2, "Operation of the Defense Acquisition System," April 5, 2002,[1] requires programs for which estimated expenditures for research, development, test, and evaluation are more than $365 million in FY 2000 constant dollars or for which procurement expenditures are more than $2.19 billion in FY 2000 constant dollars be classified as acquisition category I major programs. The Instruction requires the DoD Component to notify the Under Secretary of Defense for Acquisition, Technology, and Logistics when cost growth or a change in acquisition strategy results in reclassifying a formerly lower acquisition category program as an acquisition category I program. Changes in the acquisition category level should be reported as soon as the DoD Component suspects, within reasonable confidence, that the program is within a 10-percent encroachment of the next acquisition category level. The Under Secretary of Defense for Acquisition, Technology, and Logistics designates an acquisition category reclassification.

ADS Research, Development, Test, and Evaluation

The ADS program manager did not recommend to the Assistant Secretary of the Navy (Research, Development, and Acquisition) that oversight of the program be raised to the level of an acquisition category I program. Since the Navy established the ADS, the estimated program costs have grown. The ADS program exceeded the research, development, test, and evaluation thresholds for an acquisition category II program, after the Assistant Secretary of the Navy

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[1]Prior versions of DoD Instruction 5000.2 also contain the requirements outlined in this report.

(Research, Development, and Acquisition) approved the program to enter the engineering and manufacturing development phase in February 2000. At the engineering and manufacturing development milestone decision review, the program office estimated that the program would require $134.6 million for research, development, test, and evaluation. The estimate was based on Platform Alpha and excluded costs for Platform Bravo. The subsequent decision to restructure the program and use a four-block acquisition strategy significantly increased the program's estimated cost for research, development, test, and evaluation. The Assistant Secretary of the Navy (Research, Development, and Acquisition) approved the program restructure in the updated engineering and manufacturing development acquisition decision memorandum dated May 25, 2001. As of June 2002, the program office estimated that research, development, test, and evaluation costs for the four-block acquisition strategy will total $793.4 million.

The ADS program manager was aware that the ADS program met the criteria for an acquisition category I program, and stated that research, development, test, and evaluation estimates were provided to the Assistant Secretary of the Navy (Research, Development, and Acquisition) as part of the normal reporting process. The program manager felt that the cost information showing that the program had exceeded the acquisition category II research, development, test, and evaluation threshold of $365 million, as established in DoD Instruction 5000.2, was sufficient notification to the Assistant Secretary of the Navy and that no further action or recommendation on his part was required.

Personnel in the Office of the Assistant Secretary of the Navy confirmed that the program manager had provided ADS research, development, test, and evaluation cost figures. However, because the program manager did not specifically reference the acquisition category II cost threshold, the personnel were not alerted that the cost threshold for an acquisition category II program had been exceeded. After being informed of the cost threshold breach, Navy personnel agreed that the ADS program should be reclassified as an acquisition category I program. Additionally, the personnel stated that they applied lessons learned from the ADS program to other Navy programs and took proactive measures to identify other programs that may have exceeded their acquisition category thresholds. As a result, another Navy program was identified and corrective action was initiated.

Acquisition Category I Oversight

Acquisition management oversight of ADS was not provided commensurate with that required for an acquisition category I program. By not recommending that the ADS program be classified as an acquisition category I program, the program office avoided additional requirements designed to provide decision makers and Congress with greater visibility into program cost, schedule, and performance for programs of this magnitude. DoD Regulation 5000.2-R requires that program managers for acquisition category I programs to prepare selected acquisition reports, unit cost reports, contractor cost data reports, manpower estimates, and to obtain an independent life-cycle cost estimate. The ADS program will benefit from the additional oversight resulting from those reporting requirements.

Recommendation and Management Comments

A. We recommend that the Assistant Secretary of the Navy (Research, Development, and Acquisition) request that the Under Secretary of Defense (Acquisition, Technology, and Logistics) designate the Advanced Deployable System as an acquisition category I program.

Management Comments. The Deputy Assistant Secretary of the Navy (Planning, Programming and Resources) concurred, pending a program review requested by the Assistant Secretary of the Navy (Research, Development, and Acquisition). The review will be completed by October 31, 2002. By that point, the Assistant Secretary will determine the appropriate acquisition category for the Advanced Deployable System and, if appropriate, request that the Under Secretary of Defense (Acquisition, Technology, and Logistics) designate the system as an acquisition category I program.

B. Earned Value Management

The program office did not apply standard estimate-at-completion formulas in calculating earned value management computations because it did not believe that the standard formulas accurately reflected the unique aspects of the ADS program. Also, the program office did not request the Defense Contract Management Agency to review earned value management calculations because it believed its personnel were better equipped to provide oversight of the research and development. As a result, the program office's EAC was significantly lower than the EAC calculated using standard formulas and did not provide decision makers with accurate data on estimated contract cost overruns.

Earned Value Management Guidance

The "Earned Value Management Implementation Guide," Revision 1, October 3, 1997, provides guidance to be used during the implementation and surveillance of contractor earned value management systems (EVMS). The Guide states that earned value management is a tool that allows program managers to manage technical, cost, and schedule progress on their contracts. Implementation of an EVMS integrates the cost, schedule, and technical aspects of the contract and provides the program manager with contractor cost and schedule performance data that:

- relate time-phased budgets to specific contract tasks or statements of work, or both;
- indicate work progress;
- properly relate cost, schedule, and technical accomplishments;
- are valid, timely, and auditable;
- provide managers with summarized information at a practical level; and
- are derived from the same internal EVMS that the contractor uses to manage the contract.

The DoD adopted industry-standard criteria that define acceptable requirements to implement EVMS on Defense contracts.

Estimate-at-Completion Calculations

Calculations for an EVMS are based on three key data points in the contractor's cost accounting system; specifically, the budgeted cost of work scheduled, the budgeted cost of work performed, and the actual cost of work performed. By comparing those three data points, managers can determine current schedule and cost variances and can use that data to predict possible schedule delays or cost overruns. Estimate-at-completion (EAC) calculations are used to predict how much a contract will cost if current schedule and cost variances continue. The

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Defense Systems Management College defines EAC as the actual cost of work performed plus an estimate for remaining work, and identifies the following standard formulas for calculating the estimate at completion.

1. $EAC_{CPI} = \dfrac{BAC}{CPI}$

2. $EAC_{Composite} = ACWP_{CUM} + \dfrac{(BAC - BCWP_{CUM})}{(CPI_{CUM} * SPI_{CUM})}$

ACWP   Actual Cost of Work Performed
BAC   Budget at Completion
BCWP   Budgeted Cost of Work Performed
CPI   Cost Performance Index
CUM   Cumulative
SPI   Schedule Performance Index

EAC Using Formulas. Because the program office completed an EVMS rephasing effort in December 2001, we limited our review of contract EVMS calculations to the months after the program restructure. Using the EVMS figures provided by the program office, we calculated the EAC for the current ADS engineering and manufacturing development contract using each of the formulas listed above, and calculated the resulting variance or estimated cost overruns. The EAC for Formula 1 includes cost variables and the EAC for Formula 2 includes both cost and schedule variables. The following table shows the results of the EAC calculations and total estimated cost overruns for the contract at the end of each month. Appendix C provides a breakout of the calculations for each authorized work element within the contract work breakdown structure.

Month-End Estimated Cost Overruns
(in millions)

	Formula One		Formula Two	
Month	EAC	Estimated Cost Overruns	EAC	Estimated Cost Overruns
January	$68.8	$6.2	$70.8	$8.2
February	68.8	6.2	69.6	7.1
March	69.2	6.7	72.1	9.5
April	69.5	7.0	72.5	9.9

EAC Using the Program Office Method. The program office used standard formulas to calculate cost and schedule variances and cost and schedule performance indices based on EVMS data. However, the program office did not use standard formulas to calculate the EAC, which is an indication of whether a

program will be completed on time and within budget. The program office did not use the standard formulas because it believed that the standard formulas did not accurately reflect the unique aspects of the ADS program. Instead, the program office stated that it calculated the EAC by adding the actual cost of work performed to an engineering estimate of work remaining. However, the program office was unable to provide documentation on the process used to develop the engineering estimate. It appears that the program office calculated the EAC by adding the actual cost of work performed to the budgeted cost of work remaining. A comparison of EAC using this method and the engineering estimate that the program office provided for April 2002 shows only a .2 percent difference in the EAC amounts -- $66.2 million as calculated and $66.3 million as provided by the program office. This method assumes that the remainder of the contract will be completed on time and within budget, an invalid assumption when based on contractor performance through April 2002. The program office calculated the January, February, March, and April EAC as $64.8, $65, $65.6, and $66.3 million, respectively, resulting in estimated cost overruns of $0.1, $0.3, $0.9 and $1.6 million, respectively. In making its EAC calculations, it appears that the program office did not consider the contractor's past performance on this contract in predicting future contract performance. The ADS program manager recognized that the EAC was unfavorable but assumed that savings in test article production costs would offset cost overruns experienced during development; however, future savings cannot be predicted and relied upon.

The following figure shows a comparison of the estimated cost overruns calculated by the program office and those calculated by using the standard formulas for January through April 2002.
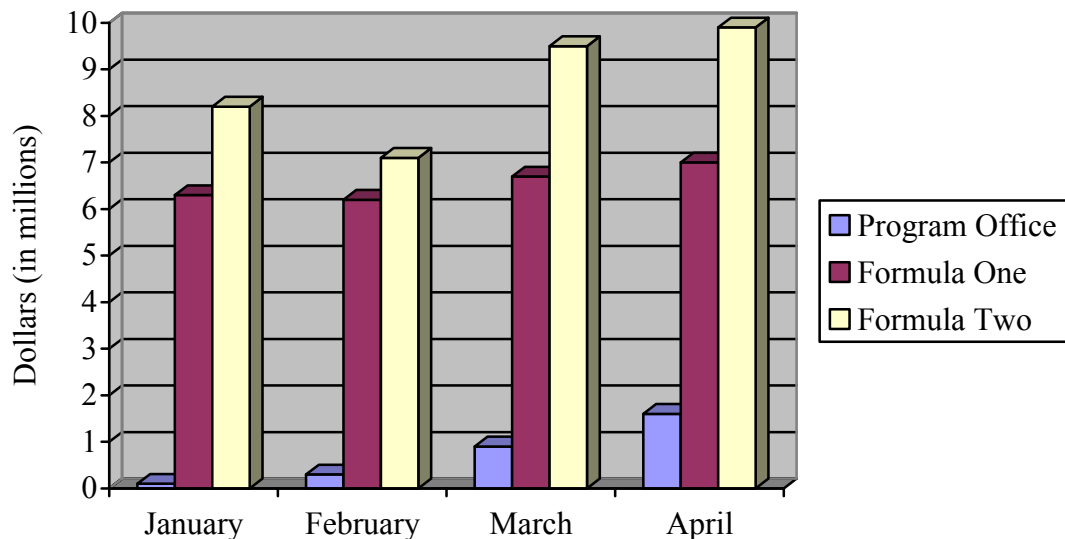
Estimated Cost Overruns in Millions

Defense Contract Management Agency Oversight

Usually, the Defense Contract Management Agency (DCMA) reviews contractors' cost and schedule control systems for acquisition program offices using earned value management techniques. After contract award, DCMA monitors contractors' performance and management systems to ensure that cost, product performance, and delivery schedules comply with the terms and conditions of the contracts. DCMA also provides EVMS tracking services to program offices. EVMS tracking services include validating contractors' EVMS, calculating schedule and cost variances, notifying program management of areas of concern, and tracking those areas from month to month.

As of June 2002, the DCMA and the ADS program office had not approved a memorandum of agreement to document a planned certification, review, and reporting process for the ADS engineering and manufacturing development contract. A draft memorandum of agreement was being circulated within the program office and DCMA for review and comment. However, the program office, in the draft memorandum of agreement, did not plan to request DCMA support to perform earned value management calculations and limited the DCMA oversight to validating the contractor's EVMS. The program manager believed that his personnel were better equipped to provide oversight of the contractor's research and development efforts. In the draft memorandum of agreement, the program office retained the responsibility for calculating schedule and cost variances and EAC.

When asked, the DCMA program integrator for ADS did not agree with the program office's assumptions or methodology for calculating the contract EAC. He stated that he preferred to use standard Formula 2 to calculate EAC because it considered both cost and schedule variables. However, he cautioned that while there is no one formula that considers all variables, the formula used should be considered a "tool" to flag areas of concern needing further explanation or mitigation. Based on the April 2002 EVMS data, calculations using Formula 2 resulted in an estimated cost overrun of $9.9 million, but the program office estimated a cost overrun of $1.6 million. The $8.3 million difference is more than 10 percent of the total contract value.

Conclusion

The ADS Program Office's calculation of EAC did not provide accurate EVMS data to effectively manage program cost and performance, and did not provide acquisition decision makers with the information needed to make fully informed investment decisions. EVMS calculations are the primary means of providing the program manager and decision makers with contractor performance information. Without accurate EVMS data, the program office cannot monitor contract progress and manage the program effectively. Although several formulas may be used to calculate EAC and many factors should be considered, the lack of documentation supporting the program office methodology and the results obtained from using either of the standard formulas call that methodology into question.

Recommendation and Management Comments

B. We recommend that the Program Manager, Advanced Deployable System revise the current draft memorandum of agreement between the program office and the Defense Contract Management Agency to include Defense Contract Management Agency oversight of contractor earned value management calculations, including standard estimate-at-completion formulas.

Management Comments. The Deputy Assistant Secretary of the Navy (Planning, Programming and Resources) concurred, stating that the program office and the Space and Naval Warfare Command will develop a memorandum of agreement with the Defense Contract Management Agency no later than November 1, 2002. He stated that all future earned value reports will include estimate-at-completion values calculated using standard formulas along with the program manager's estimate-at-completion.

C. Program Documentation

The ADS Program Office had not completed actions to update the acquisition strategy; cost analysis requirements description; life-cycle cost estimate; C^{4}I support plan; and programmatic environmental, safety, and health evaluation plan as required to show the current status of the program. This condition occurred because the program office could not update program documentation because an updated ORD and test and evaluation master plan were not yet approved. As a result, the program manager did not have up-to-date acquisition documentation needed to effectively manage program cost and performance and acquisition decision makers could not make fully informed investment decisions.

Program Documentation Requirements

DoD Policy. DoD Instruction 5000.2 and DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," April 2002,[2] establish policies and procedures for managing acquisition programs. The DoD 5000 documents state that program managers for defense acquisitions are to rely on and generate program documents needed for program execution and decision making. Program documents include the acquisition strategy; cost analysis requirements description (CARD); life-cycle cost estimate; C^{4}I support plan; programmatic environmental, safety, and health evaluation plan; and acquisition decision memorandum. Those interrelated documents help the program manager to provide decision makers with the information needed to oversee and make important program decisions.

Navy Policy. Secretary of the Navy Instruction 5000.2B, "Implementation of Mandatory Procedures for Major and Non-Major Defense Acquisition Programs and Major and Non-Major Information Technology Acquisition Programs," December 6, 1996, provides mandatory procedures for Department of the Navy implementation of DoD Regulation 5000.2-R.

Status of Program Documents

The program office had not completed actions to update the acquisition strategy; CARD; life-cycle cost estimate; C^{4}I support plan; and programmatic environmental, safety, and health evaluation plan as required to show the current status of the program.

Acquisition Strategy. DoD Regulation 5000.2-R requires the program manager to develop the acquisition strategy at program initiation and update it whenever there is a change or as the system approach and program elements are better defined. The program manager develops and documents an acquisition strategy to serve as a road map from program initiation through post-production support.

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[2]Prior versions of DoD Regulation 5000.2-R also contain the requirements outlined in this report.

The program office prepared the initial acquisition strategy in April 1994 in preparation for program initiation. It was revised in January 2000 for the engineering and manufacturing review. The program manager stated that the acquisition strategy was being updated again because of a decision to purchase specific equipment using a sole-source contract, rather than using a competitive contracting process identified in the original acquisition strategy. In addition to the change in contracting procedures, the acquisition strategy needed to be updated to show the four-block evolutionary acquisition strategy adopted by the program office. The program office developed an acquisition strategy outline in May 2002, and planned to revise it by August 2002. The revised acquisition strategy will be completed in time to support the program review that the Assistant Secretary of the Navy (Research, Development, and Acquisition) requested in the May 25, 2001, update to the acquisition decision memorandum that approved the program restructure. The review was to take place 1 year after the program restructure was approved and is currently scheduled for the fourth quarter of FY 2002.

Cost Analysis Requirements Description. DoD Regulation 5000.2-R requires DoD Components for acquisition category I programs to establish, as a basis for the life-cycle cost estimate, a description of the salient features of the acquisition program and of the system itself. The description, referred to as the CARD, is to be flexible, tailored, and refer to information available in other documents. Secretary of the Navy Instruction 5000.2B extends the CARD requirement to all acquisition programs. DoD Manual 5000.4-M, "Department of Defense Cost Analysis Guidance and Procedures," December 11, 1992, provides guidance on preparing the CARD. The Manual requires that the CARD be prepared by the program office and approved by the DoD Component's Program Executive Officer. The CARD is to contain the following elements: a system overview, system risk assessment, system operational concept, quantity requirements, system manpower requirements, system activity rates, a milestone schedule, an acquisition strategy, a development plan, facility requirements, and the contractor's cost data reporting plan. Additionally, the Manual requires that the CARD be regarded as a "living" document that is updated to show any changes that have occurred or the availability of new data.

The program office prepared the CARD for the ADS program in October 1999. The CARD was divided into sections, each section corresponding to the required elements as stated above. The system overview provided a description of the ADS and mentioned the two deployment options, Platform Alpha and Platform Bravo. However, because the original plan was to produce Platform Alpha before Platform Bravo, the CARD discussed only Platform Alpha in the remaining sections and stated that a new CARD would be produced for Platform Bravo. As of June 2002, the Program Office had not updated the CARD to discuss the unique aspects of Platform Bravo even though the acquisition plan for the ADS involves producing and deploying Platform Bravo before Platform Alpha. Additionally, the sections on system risk and system operational concepts were incomplete and referred the reader to undefined documents for information. Accordingly, the program office needs to update and complete the CARD so that cost estimators can use it to develop a reliable life-cycle cost estimate for the program.

The program office stated that it was preparing updates to the CARD and that each block would have an appendix within the CARD that described the unique aspects of that block. However, the program office did not plan to prepare the appendix for each block until the program office completes a detailed design review for each block. As a consequence, cost estimators will not be able to provide the program office with reliable total cost estimates until late in the life cycle of the program, which, in turn, will prevent decision makers from making early investment decisions that are based on total program costs.

Life-Cycle Cost Estimate. The life-cycle cost estimate represents the total cost to the Government for the acquisition and ownership of a system over its useful life. It includes the cost of development, acquisition, operations and support and, where applicable, disposal. DoD Regulation 5000.2-R requires that program managers for all major defense acquisition programs prepare a life-cycle cost estimate in support of program initiation and at all subsequent milestone reviews. Secretary of the Navy Instruction 5000.2B extends the life-cycle cost estimate requirement to all acquisition programs.

The program office prepared a life-cycle cost estimate for the engineering and manufacturing program review in November 1999. The program office based the life-cycle cost estimate on the assumption that Platform Alpha would be developed and procured before Platform Bravo. However, in April 2001, the Office of the Chief of Naval Operations directed the program office to develop and procure Platform Bravo first and identified deployment options for each platform. In response, the program office initiated a four-block acquisition strategy. As of June 2002, the program office had not determined the additional time and cost associated with the new acquisition strategy and had not calculated disposal costs. Many of the decisions throughout the life of the program are based on the life-cycle costs, not the least of which is to determine the appropriate level of program oversight. Program oversight is dependent on estimated program costs for research, development, test, and evaluation and procurement. Further, without a realistic life-cycle cost estimate, program decision makers will not be able to oversee and evaluate program management and affordability.

The program office stated that separate life-cycle cost estimates, to include disposal costs, will be prepared for each ADS block as it becomes defined in sufficient detail. The Block I life-cycle cost estimate and the preliminary life-cycle cost estimate for Block II will be available for the fourth quarter FY 2002, Assistant Secretary of the Navy (Research, Development, and Acquisition) program review. The life-cycle cost estimate for Block II will include development and production costs, but not operation and support costs because those costs will not be sufficiently defined. The program office plans to have preliminary life-cycle cost estimates for Blocks III and IV in FY 2003. The program office stated that complete life-cycle cost estimates for Blocks II through IV, including operation and support costs and disposal costs, will not be available until after the system design review for each block and will be updated after the detailed design review for each block. While this schedule shows a plan for updating the life-cycle cost estimate, the program office will not have a reasonable estimate of total program cost until late in the engineering and manufacturing development phase of the acquisition process. To make affordability decisions for the ADS program, the program office needs to complete a comprehensive life-cycle cost estimate to include all costs of the

four-block program, even if costs for Blocks II through IV cannot be completed in detail. The program office can update the life-cycle cost estimate as necessary, but the program office needs to have an estimate of total life-cycle costs now to make management and affordability decisions for the program. Additionally, an independent life-cycle cost estimate was not performed earlier because an independent estimate is not required for acquisition category II programs. When the program is redesignated as an acquisition category I program as required, an independent life-cycle cost estimate must be prepared.

C^{4}I Support Plan. DoD Regulation 5000.2-R requires that DoD Components develop C^{4}I support plans for all programs early in the acquisition process when the Components connect in any way to the communication and information infrastructure. Additionally, DoD Instruction 5000.2 requires each program manager to address system interoperability in the C^{4}I support plan. The Instruction defines interoperability as the ability of systems, units, or forces to provide services to or accept services from other systems, units, or forces and to use the services so exchanged to operate effectively together. The Instruction also states that the outcome of systems acquisition is a system that is interoperable with other systems (U.S., Coalition, and allied systems, as specified in the ORD). Further, acquisition decision makers are required to review the C^{4}I support plan at each milestone; at decision reviews, as appropriate; and whenever support requirements change.

The program office recognized the need for a C^{4}I support plan based on ADS interfaces with other C^{4}I systems, and prepared the initial C^{4}I support plan during the program definition and risk reduction phase of the acquisition process. The program office plans to update its C^{4}I support plan in FY 2004 because the Space and Naval Warfare Systems Command issued guidance requiring that all Command programs set aside FY 2004 funds to update C^{4}I support plans. In addition to the availability of funding, program office personnel believed that collaborating with other program offices that were updating their C^{4}I support plans in FY 2004 would result in a better C^{4}I support plan.

However, an important function of a C^{4}I support plan is to identify interfaces that need to be tested. The first land integration test where ADS interfaces will be tested is scheduled for the first quarter FY 2004. Accordingly, it is too late in the process for the program office to wait until FY 2004 to begin updating the C^{4}I support plan to incorporate the updated operational requirements and system configuration changes. Personnel from the Office of the Commander, Operational Test and Evaluation Force stated that the C^{4}I support plan should be completed before the land integration test.

Programmatic Environmental, Safety, and Health Evaluation Plan. DoD Regulation 5000.2-R requires that the program manager include a programmatic environmental, safety, and health evaluation plan in the acquisition strategy. The program manager is to initiate the evaluation at the earliest possible time in support of a program initiation decision and maintain an updated evaluation throughout the life cycle of the program. The program manager is to ensure that the system can be tested, operated, maintained, repaired, and disposed of in compliance with environmental regulations and DoD Regulation 5000.2-R requirements.

The Naval Facilities Engineering Service Center prepared a programmatic environmental, safety, and health evaluation plan for ADS in May 1997, and updated it in July 1999. The Center identified potential risks that could occur despite program office compliance and mitigation activities. Moderate risks identified included concerns involving marine mammals and endangered species, personnel safety hazards because of the lithium battery storage and use, and air emissions that may become an issue as production rates increase.

One mitigation method that the program office used during the tests was marine mammal watching as they gradually increased acoustic sound to the desired testing level. Also, the primary hardware manufacturer prepared a preliminary point paper primarily addressing disposal of batteries and cables. When the programmatic environmental, safety, and health evaluation plan was completed, the program office identified no safety hazards. In addition, two environmental assessments were conducted; both resulted in findings of no significant impact. However, the change in the deployment method of ADS may affect the environment and the safety and health of the crew. As a result, the program office stated that the Naval Facilities Engineering Service Center was updating the programmatic environmental, safety, and health evaluation plan concurrently with the ORD approval process.

Conclusion

Documentation is the primary means of providing the milestone decision authority, as well as other key managers, with information needed for decision making. Without accurate and up-to-date program documents, such as the acquisition strategy, CARD, life-cycle cost estimate, C^4I support plan, and programmatic environmental, safety, and health plan, the program office cannot provide assurance to acquisition decision makers that performance and cost thresholds are being achieved and that the program is affordable. Although the program office believed that the ORD would be approved in August 2002, with the test and evaluation master plan being approved shortly thereafter, the ADS program office did not have the up-to-date acquisition documentation needed to effectively manage program cost and performance, and acquisition decision makers could not make fully informed investment decisions.

Recommendations and Management Comments

C. We recommend that the program manager for the Advanced Deployable System, concurrent with the approval of the operational requirements document and the test and evaluation master plan:

1. Update the acquisition strategy to incorporate the restructured four-block evolutionary acquisition strategy.

2. Update the cost analysis requirements description to be used as a basis for the life-cycle cost estimate.

3. Update the life-cycle cost estimate, including disposal costs, for all four blocks of the evolutionary acquisition strategy and direct the independent review of the life-cycle cost estimate.

4. Update the command, control, communications, computers, and intelligence support plan to document required interfaces with other systems.

5. Update the programmatic environmental, safety, and health evaluation plan to show that the system can be tested, operated, maintained, repaired, and disposed of in compliance with environmental regulations.

Management Comments. The Deputy Assistant Secretary of the Navy (Planning, Programming and Resources) concurred and provided the following dates for completing the document revisions:

- Updates to the acquisition strategy and life-cycle cost estimate, inclusive of all four blocks of the Advanced Deployable System program, will be completed no later than February 28, 2003.

- Updates to the command, control, communications, computers, and intelligence support plan and programmatic environmental, safety, and health evaluation plan will be completed no later than October 30, 2002.

Additionally, the program office is developing a plan of action and milestones to drive and track the process for updating all needed documentation in a timely manner. This action plan will be completed before the program review planned for October 2002.

Appendix A. Scope and Methodology

In conducting this program audit, we reviewed documentation dated from March 1993 through May 2002. We interviewed and obtained documentation from the staffs of the Director, Operational Test and Evaluation; Director, Defense Contract Management Agency; Assistant Secretary of the Navy (Research, Development, and Acquisition); Deputy Chief of Naval Operations (Warfare Requirements and Programs); Commander, Operational Test and Evaluation Force; Commander, Space and Naval Warfare Command; and Program Manager, Advanced Deployable System. We used criteria in DoD Regulation 5000.2-R to perform the audit. To accomplish the audit objectives, we took the following steps:

- determined whether the users had adequately defined the system requirements;

- determined whether the program office had developed and implemented an acquisition plan, a risk management plan, and a test and evaluation plan;

- evaluated the Defense Contract Management Agency's involvement in monitoring the contractor's earned value management process;

- evaluated the program office's management of contracts for the program;

- determined whether the program office had a fully developed, programmatic, environmental, safety, and health evaluation plan;

- assessed the program office's implementation of the DoD environmental management process;

- determined whether the program office had prepared a life-cycle cost estimate for the program;

- evaluated program office use of integrated product teams; and

- reviewed management controls related to the audit objective.

Audit Dates and Standards. We performed this audit from October 2001 through June 2002 in accordance with generally accepted government auditing standards.

Use of Computer-Processed Data. We did not use computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within the DoD and contractor locations.

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the DoD Weapons System Acquisition high-risk area.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, require DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of the Review of the Management Control Program. In accordance with DoD Regulation 5000.2-R, acquisition managers are to use program cost, schedule, and performance parameters as control objectives to implement the requirements of DoD Directive 5010.38. Accordingly, we limited our review to management controls directly related to program definition, structure, design assessments and decision reviews, and periodic reporting.

Adequacy of Management Controls. We identified material management control weaknesses for the acquisition of the ADS as defined by DoD Instruction 5010.40. Controls over program documentation were insufficient to ensure that acquisition decision makers were provided updated acquisition documentation in time to effectively manage program cost and performance. Recommendations C.1., C.2., C.3., C.4., and C.5., if implemented, will improve the quality and timeliness of program information provided to acquisition decision makers so they can make fully informed investment decisions. A copy of the report will be provided to the senior official responsible for management controls in the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics and the Department of the Navy.

Adequacy of Management's Self Evaluation. In June 1998, the Space and Naval Warfare Command identified the ADS program office as an assessable unit. However, in that evaluation, the Space and Naval Warfare Command did not identify the specific material management control identified by the audit because the weakness occurred after the June 1998 evaluation.

Prior Coverage

During the last 5 years, the General Accounting Office, the Inspector General of the Department of Defense, and the Naval Audit Service have not issued reports specifically addressing the ADS.

Appendix B. Definitions of Technical Terms

Acquisition Phase. An acquisition phase represents all the tasks and activities needed to bring a program to the next major milestone. Phases provide a logical means of progressively translating broadly stated mission needs into well-defined, system-specific requirements and, ultimately, into operationally effective, suitable, and survivable systems.

Evolutionary Acquisition. An evolutionary acquisition is an acquisition strategy that defines, develops, produces or acquires, and fields an initial hardware or software increment of operational capability. There are two basic approaches to evolutionary acquisition. In one approach, the ultimate purpose can be defined at the beginning of the program, with the content of each deployable increment determined by the maturation of key technologies. In the second approach, the ultimate purpose cannot be defined at the beginning of the program, and each increment of the capability is defined by the maturation of the technologies matched with the evolving needs of the user.

Engineering and Manufacturing Development. Engineering and manufacturing development is the third phase of the acquisition process where the program office and its contractors fully develop, engineer, design, fabricate, test, and evaluate the systems and the principal items necessary for its support.

Full-Rate Production. Full-rate production is contracting for economic production quantities following stabilization of the system design and validation of the production process.

Milestone. A milestone is the point where the milestone decision authority decides whether to start or continue an acquisition program in the acquisition process.

Milestone Decision Authority. A milestone decision authority is the individual designated in accordance with criteria established by the Under Secretary of Defense for Acquisition, Technology, and Logistics to approve entry of an acquisition program in to the next phase of the acquisition process.

Operational Requirements Document. The ORD is a formatted statement containing performance and related operational performance parameters for the proposed concept or system. The ORD is prepared by the user or user's representative.

Programmatic Environmental, Safety, and Health Evaluation Plan. A programmatic environmental, safety, and health evaluation plan is written to document the program manager's strategy for meeting environmental, safety, and health requirements; establish responsibilities; and identify how progress will be tracked.

Test and Evaluation Master Plan. The test and evaluation master plan documents the overall structure and objectives of the test and evaluation program. It provides a framework within which to generate detailed test and evaluation plans and documents schedule and resource implications associated with the test and evaluation program. The test and evaluation master plan identifies the necessary developmental test and evaluation, operational test and evaluation, and live-fire test and evaluation activities.

Appendix C. Estimate-at-Completion Calculations

January — Cumulative

	Work Breakdown Structure	BCWS[1]	BCWP[2]	ACWP[3]	SPI[4]	CPI[5]	BAC[6]	Formula One EAC[7]	Formula One VAC[8]	Formula Two EAC[9]	Formula Two VAC
1.1	Wet End Subsystem (WES)	2623	2872	3289	1.0949	0.8732	19341	22149	-2808	20514	-1173
1.1.1	Packed Array Dispenser	224	231	502	1.0313	0.4602	2758	5994	-3236	5827	-3069
1.1.2	Cable Pack	564	460	442	0.8156	1.0407	4163	4000	163	4805	-642
1.1.3	Node/Battery/Pressure Vessel/Assembly	470	606	671	1.2894	0.9031	1686	1867	-181	1598	88
1.1.4	Shell Assembly	422	438	507	1.0379	0.8639	3194	3697	-503	3581	-387
1.1.5	Shore Landing Cable/Termination	0	0	30	0.0000	0.0000	1034	0	0	0	0
1.1.7	Test and Interface	321	358	476	1.1153	0.7521	1574	2093	-519	1926	-352
1.1.9	WES Integration Assembly and Test	7	0	1	0.0000	0.0000	295	0	0	0	0
1.1.10	WES Support to Program Manager and Meetings	360	369	331	1.0250	1.1148	2113	1895	218	1857	256
1.1.11	WES Support to System Engineering	145	261	250	1.8000	1.0440	1005	963	42	646	359
1.1.12	WES Support to Test and Evaluation	0	0	0	0.0000	0.0000	439	0	0	0	0
1.1.13	WES Supportability	110	149	79	1.3545	1.8861	1080	573	507	443	637
1.4	Dry End (DE) Support	525	422	548	0.8038	0.7701	3669	4764	-1095	5794	-2125
1.4.1	DE Support Hardware	84	77	80	0.9167	0.9625	1125	1169	-44	1268	-143
1.4.2	DE Processing Software	0	0	0	0.0000	0.0000	216	0	0	0	0
1.4.3	DE Assembly Integration and Test, Spares and Support	152	122	179	0.8026	0.6816	825	1210	-385	1464	-639
1.8	Mission Planning	289	223	289	0.7716	0.7716	1503	1948	-445	2439	-936
1.7	Installation Support Subsystem (ISS)	3266	2876	3339	0.8806	0.8613	22725	26383	-3658	29508	-6783
1.7.1	Wet End Maintenance and Repair Segment	239	248	262	1.0377	0.9466	2433	2570	-137	2487	-54
1.7.2	Control and Monitoring Hardware	392	361	553	0.9209	0.6528	1379	2112	-733	2246	-867
1.7.3	Wet End Capsule	900	873	945	0.9700	0.9238	5294	5731	-437	5879	-585
1.7.4	Trunk Capsule	51	92	59	1.8039	1.5593	921	591	330	354	567
1.7.5	Inboard Mechanical Equipment	444	353	425	0.7950	0.8306	1303	1569	-266	1864	-561
1.7.6	Software	3	22	32	7.3333	0.6875	423	615	-192	112	311
1.7.7	ISS Integration, Assembly and Test	13	1	2	0.0769	0.5000	1822	3644	-1822	47348	-45526
1.7.8	ISS Support to Project Manager and Meetings	584	526	556	0.9007	0.9460	3076	3251	-175	3549	-473
1.7.9	ISS Support to System Engineering and Configuration Management	530	311	408	0.5868	0.7623	1958	2569	-611	4090	-2132
1.7.10	ISS Support to Test and Evaluation	0	0	0	0.0000	0.0000	2826	0	0	0	0
1.7.11	ISS Supportability	110	89	97	0.8091	0.9175	1290	1406	-116	1715	-425
1.11	System Engineering and Program Management	2263	2361	2179	1.0433	1.0835	16827	15530	1297	14976	1851
1.11.1	Program Management	1086	1087	1111	1.0009	0.9784	7040	7195	-155	7190	-150
1.11.2	System Engineering	708	733	690	1.0353	1.0623	4222	3974	248	3862	360
1.11.3	System Test and Evaluation	469	541	378	1.1535	1.4312	5565	3888	1677	3421	2144
	Total						62562	68827	-6265	70792	-8230

[1]Budgeted Cost of Work Scheduled
[2]Budgeted Cost of Work Performed
[3]Actual Cost of Work Performed
[4]Schedule Performance Index (BCWP / BCWS)
[5]Cost Performance Index (BCWP / ACWP)
[6]Budget at Completion
[7]Estimate at Completion (Budget / CPI)
[8]Variance at Completion (BAC - EAC)
[9]Estimate at Completion ((BAC - BCWP) / (CPI * SPI) + ACWP)

February

Work Breakdown Structure		BCWS[1]	BCWP[2]	Cumulative ACWP[3]	SPI[4]	CPI[5]	BAC[6]	Formulat One EAC[7]	VAC[8]	Formula Two EAC[9]	VAC
1.1	Wet End Subsystem (WES)	2989	3225	3891	1.0790	0.8288	19341	23335	-3994	21912	-2571
1.1.1	Packed Array Dispenser	229	238	571	1.0393	0.4168	2758	6617	-3859	6388	-3630
1.1.2	Cable Pack	660	635	556	0.9621	1.1421	4163	3645	518	3767	396
1.1.3	Node/Battery/Pressure Vessel/Assembly	480	666	804	1.3875	0.8284	1686	2035	-349	1691	-5
1.1.4	Shell Assembly	515	455	540	0.8835	0.8426	3194	3791	-597	4219	-1025
1.1.5	Shore Landing Cable/Termination	0	0	35	0.0000	0.0000	1034	0	0	0	0
1.1.7	Test and Interface	388	384	575	0.9897	0.6678	1574	2357	-783	2375	-801
1.1.9	WES Integration Assembly and Test	7	0	8	0.0000	0.0000	295	0	0	0	0
1.1.10	WES Support to Program Manager and Meetings	411	426	451	1.0365	0.9446	2113	2237	-124	2174	-61
1.1.11	WES Support to System Engineering	166	263	245	1.5843	1.0735	1005	936	69	681	324
1.1.12	WES Support to Test and Evaluation	0	0	0	0.0000	0.0000	439	0	0	0	0
1.1.13	WES Supportability	133	158	106	1.1880	1.4906	1080	725	355	627	453
1.4	Dry End (DE) Support	652	453	641	0.6948	0.7067	3669	5192	-1523	7191	-3522
1.4.1	DE Support Hardware	109	88	91	0.8073	0.9670	1125	1163	-38	1419	-294
1.4.2	DE Processing Software	0	0	3	0.0000	0.0000	216	0	0	0	0
1.4.3	DE Assembly Integration and Test, Spares and Support	180	167	213	0.9278	0.7840	825	1052	-227	1118	-293
1.8	Mission Planning	363	198	334	0.5455	0.5928	1503	2535	-1032	4370	-2867
1.7	Installation Support Subsystem (ISS)	3720	3622	3865	0.9737	0.9371	22725	24250	-1525	24801	-2076
1.7.1	Wet End Maintenance and Repair Segment	259	244	277	0.9421	0.8809	2433	2762	-329	2915	-482
1.7.2	Control and Monitoring Hardware	478	441	539	0.9226	0.8182	1379	1685	-306	1782	-403
1.7.3	Wet End Capsule	959	990	1045	1.0323	0.9474	5294	5588	-294	5446	-152
1.7.4	Trunk Capsule	53	95	52	1.7925	1.8269	921	504	417	304	617
1.7.5	Inboard Mechanical Equipment	528	478	640	0.9053	0.7469	1303	1745	-442	1860	-557
1.7.6	Software	3	22	63	7.3333	0.3492	423	1211	-788	220	203
1.7.7	ISS Integration, Assembly and Test	42	1	2	0.0238	0.5000	1822	3644	-1822	152966	-151144
1.7.8	ISS Support to Project Manager and Meetings	667	681	645	1.0210	1.0558	3076	2913	163	2867	209
1.7.9	ISS Support to System Engineering and Configuration Management	600	558	479	0.9300	1.1649	1958	1681	277	1771	187
1.7.10	ISS Support to Test and Evaluation	0	0	0	0.0000	0.0000	2826	0	0	0	0
1.7.11	ISS Supportability	131	112	123	0.8550	0.9106	1290	1417	-127	1636	-346
1.11	System Engineering and Program Management	2605	2657	2524	1.0200	1.0527	16827	15985	842	15721	1106
1.11.1	Program Management	1258	1262	1286	1.0032	0.9813	7040	7174	-134	7155	-115
1.11.2	System Engineering	810	817	810	1.0086	1.0086	4222	4186	36	4157	65
1.11.3	System Test and Evaluation	537	578	428	1.0764	1.3505	5565	4121	1444	3859	1706
	Total						62562	68761	-6199	69625	-7063

[1] Budgeted Cost of Work Scheduled
[2] Budgeted Cost of Work Performed
[3] Actual Cost of Work Performed
[4] Schedule Performance Index (BCWP / BCWS)
[5] Cost Performance Index (BCWP / ACWP)
[6] Budget at Completion
[7] Estimate at Completion (Budget / CPI)
[8] Variance at Completion (BAC - EAC)
[9] Estimate at Completion ((BAC - BCWP) / (CPI * SPI) + ACWP)

Work Breakdown Structure		BCWS[1]	BCWP[2]	Cumulative ACWP[3]	SPI[4]	CPI[5]	BAC[6]	Formula One EAC[7]	VAC[8]	Formula Two EAC[9]	VAC[8]
1.1	Wet End Subsystem (WES)	3703	3833	4597	1.0351	0.8338	19275	23117	-3842	22489	-3214
1.1.1	Packed Array Dispenser	290	324	669	1.1172	0.4843	2682	5538	-2856	5027	-2345
1.1.2	Cable Pack	780	821	595	1.0526	1.3798	4153	3010	1143	2889	1264
1.1.3	Node/Battery/Pressure Vessel/Assembly	522	679	906	1.3008	0.7494	1686	2250	-564	1939	-253
1.1.4	Shell Assembly	721	548	648	0.7601	0.8457	3194	3777	-583	4765	-1571
1.1.5	Shore Landing Cable/Termination	0	0	40	0.0000	0.0000	1034	0	0	0	0
1.1.7	Test and Interface	551	468	770	0.8494	0.6078	1594	2623	-1029	2951	-1357
1.1.9	WES Integration Assembly and Test	7	0	2	0.0000	0.0000	295	0	0	0	0
1.1.10	WES Support to Program Manager and Meetings	467	479	523	1.0257	0.9159	2113	2307	-194	2262	-149
1.1.11	WES Support to System Engineering	199	306	308	1.5377	0.9935	1005	1012	-7	766	239
1.1.12	WES Support to Test and Evaluation	0	0	0	0.0000	0.0000	439	0	0	0	0
1.1.13	WES Supportability	166	208	136	1.2530	1.5294	1080	706	374	591	489
1.4	Dry End (DE) Support	844	516	752	0.6114	0.6862	3669	5347	-1678	8268	-4599
1.4.1	DE Support Hardware	128	91	97	0.7109	0.9381	1125	1199	-74	1647	-522
1.4.2	DE Processing Software	16	2	8	0.1250	0.2500	216	864	-648	6856	-6640
1.4.3	DE Assembly Integration and Test, Spares and Support	223	198	265	0.8879	0.7472	825	1104	-279	1210	-385
1.8	Mission Planning	477	225	382	0.4717	0.5890	1503	2552	-1049	4982	-3479
1.7	Installation Support Subsystem (ISS)	4376	4209	4501	0.9618	0.9351	22791	24372	-1581	25161	-2370
1.7.1	Wet End Maintenance and Repair Segment	303	322	300	1.0627	1.0733	2433	2267	166	2151	282
1.7.2	Control and Monitoring Hardware	576	450	635	0.7813	0.7087	1445	2039	-594	2432	-987
1.7.3	Wet End Capsule	1172	1183	1238	1.0094	0.9556	5294	5540	-246	5500	-206
1.7.4	Trunk Capsule	55	98	60	1.7818	1.6333	921	564	357	343	578
1.7.5	Inboard Mechanical Equipment	607	533	753	0.8781	0.7078	1303	1841	-538	1992	-689
1.7.6	Software	9	105	88	11.6667	1.1932	423	355	68	111	312
1.7.7	ISS Integration, Assembly and Test	82	1	2	0.0122	0.5000	1822	3644	-1822	298646	-296824
1.7.8	ISS Support to Project Manager and Meetings	762	775	735	1.0171	1.0544	3076	2917	159	2881	195
1.7.9	ISS Support to System Engineering and Configuration Management	648	606	548	0.9352	1.1058	1958	1771	187	1855	103
1.7.10	ISS Support to Test and Evaluation	0	0	0	0.0000	0.0000	2826	0	0	0	0
1.7.11	ISS Supportability	162	136	142	0.8395	0.9577	1290	1347	-57	1577	-287
1.11	System Engineering and Program Management	2943	2988	2910	1.0153	1.0268	16827	16388	439	16185	642
1.11.1	Program Management	1434	1430	1473	0.9972	0.9708	7040	7252	-212	7268	-228
1.11.2	System Engineering	916	918	925	1.0022	0.9924	4222	4254	-32	4247	-25
1.11.3	System Test and Evaluation	593	640	512	1.0793	1.2500	5565	4452	1113	4163	1402
Total							62562	69224	-6662	72102	-9540

[1]Budgeted Cost of Work Scheduled
[2]Budgeted Cost of Work Performed
[3]Actual Cost of Work Performed
[4]Schedule Performance Index (BCWP / BCWS)

[5]Cost Performance Index (BCWP / ACWP)
[6]Budget at Completion
[7]Estimate at Completion (Budget / CPI)
[8]Variance at Completion (BAC - EAC)
[9]Estimate at Completion ((BAC - BCWP) / (CPI * SPI) + ACWP)

April

Cumulative

Work Breakdown Structure		BCWS[1]	BCWP[2]	ACWP[3]	SPI[4]	CPI[5]	BAC[6]	Formula One		Formula Two	
								EAC[7]	VAC[8]	EAC[9]	VAC
1.1	Wet End Subsystem (WES)	4302	4180	5261	0.9716	0.7945	19341	24343	-5002	24900	-5559
1.1.1	Packed Array Dispenser	402	351	773	0.8731	0.4541	2682	5907	-3225	6652	-3970
1.1.2	Cable Pack	890	841	652	0.9449	1.2899	4153	3220	933	3369	784
1.1.3	Node/Battery/Pressure Vessel/Assembly	547	698	959	1.2761	0.7278	1686	2316	-630	2023	-337
1.1.4	Shell Assembly	831	681	785	0.8195	0.8675	3194	3682	-488	4320	-1126
1.1.5	Shore Landing Cable/Termination	0	0	47	0.0000	0.0000	1034	0	1034	0	1034
1.1.7	Test and Interface	654	527	901	0.8058	0.5849	1660	2838	-1178	3305	-1645
1.1.9	WES Integration Assembly and Test	7	1	17	0.1429	0.0588	295	5015	-4720	35003	-34708
1.1.10	WES Support to Program Manager and Meetings	517	526	631	1.0174	0.8336	2113	2535	-422	2502	-389
1.1.11	WES Support to System Engineering	261	325	341	1.2452	0.9531	1005	1054	-49	914	91
1.1.12	WES Support to Test and Evaluation	0	0	0	0.0000	0.0000	439	0	439	0	439
1.1.13	WES Supportability	193	230	155	1.1917	1.4839	1080	728	352	636	444
1.4	Dry End (DE) Support	974	673	805	0.6910	0.8360	3669	4389	-720	5991	-2322
1.4.1	DE Support Hardware	134	91	103	0.6791	0.8835	1125	1273	-148	1826	-701
1.4.2	DE Processing Software	32	11	12	0.3438	0.9167	216	236	-20	663	-447
1.4.3	DE Assembly Integration and Test, Spares and Support	255	211	299	0.8275	0.7057	825	1169	-344	1351	-526
1.8	Mission Planning	553	360	391	0.6510	0.9207	1503	1632	-129	2298	-795
1.7	Installation Support Subsystem (ISS)	4964	4723	5075	0.9515	0.9306	22791	24490	-1699	25480	-2689
1.7.1	Wet End Maintenance and Repair Segment	357	365	353	1.0224	1.0340	2433	2353	80	2309	124
1.7.2	Control and Monitoring Hardware	657	531	735	0.8082	0.7224	1445	2000	-555	2300	-855
1.7.3	Wet End Capsule	1360	1348	1362	0.9912	0.9897	5294	5349	-55	5384	-90
1.7.4	Trunk Capsule	57	101	71	1.7719	1.4225	921	647	274	396	525
1.7.5	Inboard Mechanical Equipment	676	597	843	0.8831	0.7082	1303	1840	-537	1972	-669
1.7.6	Software	23	125	115	5.4348	1.0870	423	389	34	165	258
1.7.7	ISS Integration, Assembly and Test	126	1	2	0.0079	0.5000	1822	3644	-1822	458894	-457072
1.7.8	ISS Support to Project Manager and Meetings	845	855	826	1.0118	1.0351	3076	2972	104	2947	129
1.7.9	ISS Support to System Engineering and Configuration Management	671	646	607	0.9627	1.0643	1958	1840	118	1888	70
1.7.10	ISS Support to Test and Evaluation	0	0	0	0.0000	0.0000	2826	0	2826	0	2826
1.7.11	ISS Supportability	192	154	161	0.8021	0.9565	1290	1349	-59	1642	-352
1.11	System Engineering and Program Management	3268	3329	3241	1.0187	1.0272	16761	16318	443	16078	683
1.11.1	Program Management	1606	1605	1633	0.9994	0.9829	7040	7163	-123	7166	-126
1.11.2	System Engineering	1007	1005	1021	0.9980	0.9843	4156	4222	-66	4229	-73
1.11.3	System Test and Evaluation	655	719	587	1.0977	1.2249	5565	4543.3	1021.7	4191	1374
	Total						62562	69539	-6977	72450	-9888

[1]Budgeted Cost of Work Scheduled
[2]Budgeted Cost of Work Performed
[3]Actual Cos of Work Performed
[4]Schedule Performance Index (BCWP / BCWS)

[5]Cost Performance Index (BCWP / ACWP)
[6]Budget at Completion
[7]Estimate at Completion (Budget / CPI)
[8]Variance at Completion (BAC - EAC)
[9]Estimate at Completion ((BAC - BCWP) / (CPI * SPI) + ACWP)

Appendix D. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense (Acquisition, Technology and Logistics)
Under Secretary of Defense (Comptroller)/Chief Financial Officer
   Deputy Chief Financial Officer
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Department of the Army

Auditor General, Department of the Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
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Assistant Secretary of the Navy (Research, Development, and Acquisition)
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Commander, Space and Naval Warfare Systems Command
   Program Director, Intelligence, Surveillance, and Reconnaissance Systems
     Program Manager, Advanced Deployable System

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
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Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Efficiency, Financial Management, and
    Intergovernmental Relations, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations,
    Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on
    Government Reform

Department of the Navy Comments

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
RESEARCH, DEVELOPMENT AND ACQUISITION
1000 NAVY PENTAGON
WASHINGTON, DC 20350-1000

19 SEP 2002

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING,
DEPARTMENT OF DEFENSE

Subj: DOD IG AUDIT PROPOSED REPORT "ACQUISITION OF THE ADVANCED
        DEPLOYABLE SYSTEM" (D2002AE-003)

Ref: (a) DoDIG Audit Report on the Acquisition of the Advanced Deployable System

Encl: (1) DoN Response to DodIG Audit Proposed Report Project D2002-0003.

        In response to reference (a), enclosure (1) is forwarded as the Department of the Navy
response to the subject audit.

William J. Schaefer
Deputy Assistant Secretary of the Navy
Planning, Programming and Resources

Copy to:
NAVAL INSPECTOR GENERAL (N43)
CNO (N77)
SPAWAR (PMW 183) (PD 18)

DEPARTMENT OF THE NAVY RESPONSE
TO
DODIG PROPOSED REPORT ON ACQUISITION OF THE ADVANCED DEPLOYABLE
SYSTEM
(D2002AE-003)

Finding A: The ADS program manager did not inform the Assistant Secretary of the Navy (Research, Development, and Acquisition) that the oversight of the program should be raised to the level of an acquisition category I program. This condition occurred because the program manager believed that the cost information showing that the program had exceeded established thresholds for research, development, test, and evaluation had been provided to the Assistant Secretary of the Navy and that no further action on his part was required. As a result, acquisition management oversight was not provided commensurate with that required for an acquisition category I program.

Recommendation A: We recommend that the Assistant Secretary of the Navy (Research, Development and Acquisition) request that the Under Secretary of Defense (Acquisition, Technology, and Logistics) designate the Advanced Deployable System as an acquisition I program.

DoN Response: Concurrence pending program review. The Assistant Secretary of the Navy (Research, Development and Acquisition) has requested a program review to be conducted with the Program Executive Officer and the Program Manager prior to the 31 October. Upon completion of the review, the Department of the Navy will make a determination of appropriate Acquisition Category for the ADS program. If warranted, the Assistant Secretary of the Navy (Research, Development and Acquisition will forward a request to the Under Secretary of Defense (Acquisition, Technology, and Logistics) to designate the Advanced Deployable System program as an acquisition I program.

Finding B: The program office did not apply standard estimate-at-completion formulas in calculating earned value management computations because it did not believe that the standard formulas accurately reflected the unique aspects of the ADS program. Also, the program office did not request the Defense Contract Management Agency to review earned value management calculations because it believed its personnel were better equipped to provide oversight of the research and development. As a result, the program office's EAC was significantly lower than the EAC calculated using standard formulas and did not provide decision makers with accurate data on estimated contract cost overruns.

Recommendation B: We recommend that the Program Manager, Advanced Deployable System revise the current draft memorandum of agreement between the program office and the Defense Contract Management Agency to include Defense Contract Management Agency oversight of contractor earned value management calculations, including standard estimate-at-completion formulas.

Enclosure (1)

28

DoN Response: Concur. The program office and SPAWAR will develop a memorandum of agreement with the Defense Contract Management Agency no later than 01 November 2002. The draft memorandum of agreement will be reviewed and approved by the Assistant Secretary of the Navy, Research, Development and Acquisition, prior to implementation. All earned value reports will include EAC values derived from standard formulas along the Program Manager's estimate-at-completion.

Finding C: The ADS Program Office had not completed actions to update the acquisition strategy; cost analysis requirements description; life-cycle cost estimate; C4I support plan; and programmatic environmental, safety, and health evaluation plan as required to show the current status of the program. This condition occurred because the program office could not update program documentation because an updated ORD and test and evaluation master plan were not yet approved. As a result, the program manager did not have up-to-date acquisition documentation needed to effectively manage program cost and performance and acquisition decision makers could not make fully informed investment decisions.

Recommendation C: We recommend that the program manager for the Advanced Deployable System, concurrent with the approval of the operational requirements document and the test and evaluation master plan:

1. Update the acquisition strategy to incorporate the restructured four-block evolutionary acquisition strategy.
2. Update the cost analysis requirements description to be used as a basis for the life-cycle cost estimate.
3. Update the life-cycle cost estimate, including disposal costs, for all four blocks of the evolutionary acquisition strategy and direct the independent review of the life-cycle cost estimate.
4. Update the command, control, communications, computers, and intelligence support plan to document required interfaces with other systems.
5. Update the programmatic, environmental, safety, and health evaluation plan to show that the system can be tested, operated, maintained, repaired, and disposed of in compliance with environmental regulations.

DoN Response: Concur. Updating of the acquisition strategy and all documentation related of the ADS program, inclusive of all four blocks, is in progress and will be completed no later than 28 February 2003. The program office will also complete a life cycle cost estimate for all four blocks by the end of February 2003. The updates to the C4I support plan and environmental, safety, and health evaluation plan will be completed no later than the 31 October 2002. The program office is developing a plan of action and milestones to drive and track the process for updating all needed documentation in a timely fashion. This action plan will be completed prior to an upcoming program review with the Assistant Secretary of the Navy (Research, Development and Acquisition) currently planned in October 2002

Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing of the Department of Defense prepared this report. Personnel of the Office of the Inspector General of the Department of Defense who contributed to the report are listed below.

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